

ing features of the *Dipodidæ* connect them with the *Hystricomorpha*, as, for example, the large infraorbital foramen (rivaling even the orbital in size) and the stout zygomatic arch in which the malar is not supported by a continuation of the maxillary zygomatic process—characters eminently distinctive of the hystricine rodents. Moreover, as in this group, none of the molars are tuberculate, but exhibit transverse laminæ as in *Chinchillidæ*, with the species of which family the *Dipodidæ* agree, not only in many striking superficial points of resemblance, as in the shape of the ears, muzzle, &c., but also in the peculiar form of the penis, of which the glans is armed, as in the Cavies and Pacas, on the upper surface with a pair of soft spines and numerous horny scutes, so differing essentially from the soft unarmed state of the same part in the *Myomorpha*.

The united condition of the leg-bones is evidently the result of special adaptation of the hind limbs for leaping; and it would be as absurd to separate this family from the *Hystricomorpha*, on this account, as it would be to elevate the *Dipodinæ* into the rank of a distinct family, and form a new group for their reception, because they differ from all other rodents in the united condition of the metatarsals, which are fused together so as to form a single bone, a condition as manifestly the result of adaptive modification as the union of the fibula with the tibia.

We may conclude, therefore, that the *Dipodidæ* must be classed as hystricine rodents having the bones of their hind limbs specially modified for leaping, and that their nearest existing allies are the family *Chinchillidæ*.

#### 4. Studies in the Holothuroidea.—I. On the Genus *Psolus* and the Forms allied thereto. By F. JEFFREY BELL, M.A., F.Z.S., Professor of Comparative Anatomy in King's College, London.

[Received October 18, 1882.]

(Plate XLVIII.)

In the following paper, and in those of which it will as I hope form the first, it is my intention to bring together into a connected form all the information which I have acquired in the difficult task of naming the collection of Holothurians in the British Museum. Various circumstances did no doubt conspire to prevent these specimens being worked out as they came into the collection; but I fancy I am hardly wrong in imagining that a not unconsidered factor was the troublesomeness of the subject, and the great demand that it makes upon the time and patience of the student.

Works of the highest importance and greatest scientific value have appeared on these forms; the anatomical monograph of Tiedemann, the researches of Johannes Müller, and the magnificent firstfruits

of Semper's voyagings are among the chief treasures of zoological and anatomical literature.

While this last-mentioned work was passing through the press, Emil Selenka selected a comprehensive revision of the known Holothuroidea as the subject of a philosophical dissertation for the doctorate; to this and to the descriptions of Prof. Ludwig the student of German literature will always have recourse.

In this, as in other divisions of the Radiata, the zoologist owes much to the long-continued researches of Professor Verrill, whose chief work on Holothurians was unfortunately, and strangely enough, progressing simultaneously with those of Semper and of Selenka.

Coming at once to the genus *Psolus*, we find that some inconvenience has arisen from this simultaneous work; for neither of the German naturalists was able to take any note of the formation by Verrill of two genera allied to *Psolus*; and we have not, therefore, their opinion on the value of the generic distinctions by means of which *Lophothuria* and *Lissothuria* are added to the Psoline subfamily—though we have, perhaps, some indication of Prof. Semper's views in the remarks that he makes on the new genus *Stolinus* formed by Selenka.

The Holothuroidea form no exception among animals; side by side with the study of their natural history we have, unfortunately, to make our way through that rapidly growing maze designated "synonymy." I can see no advantage in retailing, at second hand, the references to earlier writers who have more or less correctly identified species, which references themselves are not without exception exact. I propose therefore to give for the sake of completeness one, and probably the most suitable, reference for each species.

In the first place, however, it will unfortunately be necessary to detail at length the history of a generic name which has attained almost as great a vogue as *Psolus* itself, and which has, even lately, been used in zoological literature. Prof. Studer (Monatsb. Ak. Berl. 1876, p. 452) doubtless, like myself (P. Z. S. 1881, p. 100), has used for *Cuvieria antarctica* the name by which that species is best known, without at the time entering upon a close bibliographical investigation.

In the Animal Kingdom there are four claimants to the name *Cuvieria*; but this, of course, is not by itself a reason why we should cease to make use of it for an Echinoderm. So far as I can discover, the first time that the name appeared in print in association with the Holothuroidea was in 1817<sup>1</sup>, when Cuvier wrote, "Celles que Péron avait nommées Cuvieriés." Péron, however, does not seem to have ever quite definitely made up his mind as to what genus or group should be dignified by association with the name of the illustrious anatomist. Several years earlier he had applied the name to a *Medusa* (Voyage, Atlas, pl. xxx. fig. 2): a little later than this he published, in conjunction with Lesueur, a 'Tableau des Méduses;' and

<sup>1</sup> Règne Anim. iv. p. 22, note (1); and see pl. xv. fig. 9, where *cuvieria* is used as a specific name.

there he makes no use of his own name *Cuvieria*, but applies that of *Berenice* to a genus to which, as Prof. Haeckel (see his *Syst. Med.* i. p. 152) assures us, his earlier and beautifully figured *Cuvieria carisochroma* would belong.

It follows therefore that Jäger (De *Holoth.* p. 30) is right in saying, "Cuvier hujus tribus autor est," and that de Blainville (*Actin.* p. 191), Brandt (*Prodr.* p. 47), and Selenka (*Zeitschr. f. wiss. Zool.* xvii. p. 343) are, in citing Péron as the author of the name, almost as wrong as Haeckel, who (*loc. cit.*), in writing "Trotzdem hat später (1817) Péron denselben Gattungsnamen für ein Echinoderm *Psolus* eingeführt," and Verrill (*Proc. Bost. Soc. N. H.* x. p. 353), by adding 1817 to the name Péron, commit the additional error of forgetting that it was seven years earlier, that is in 1810, that there was lost to science an investigator so enthusiastic and so distinguished that one feels the chilly formality of the terms in which regret was expressed at his death—"aussi affligeante pour les amis des sciences qu'elle le fut pour les siens propres" (Pref. to vol. ii. of the 'Voyage').

Curiously enough, the history of the name does not end here. Just as *Cuvieria* dropped out from Péron's names for *Medusæ*, so did Cuvier's picture of *Hol. cuvieria*, which appeared in the 1817 and 1829 editions of the 'Règne Animal,' disappear from the plates of the magnificent edition of that monumental work which we owe to the devotion of a "réunion de disciples de Cuvier."<sup>1</sup> It did not disappear, however, before it gave rise to one of the most curious mistakes committed by a famous naturalist: a reference to the account given by de Blainville in the *Dict. Sc. Nat.* xxi. (1821) pp. 315-317, shows quite clearly that that distinguished student mistook the oral for the anal pole of the body. As the description is rare, if we may judge from the fact that it was not seen by Prof. Semper (*Hol.* p. 241), I propose to quote it in full:—

"*H. cuvieria*, G. Cuv. Règne Anim. pl. xv. 9. Corps ovale, comme rugueux, l'anus supérieur entouré de cinq tentacules squamiformes; les tentacules de la bouche au nombre de dix (?) et presque filiformes. Des mers de l'Australasie (?)."

A comparison of this description with the figure of Cuvier and with that given for what is clearly the same form by Selenka (*Zeits. wiss. Zool.* xviii. pl. viii. fig. 1), who calls it *Stolinus cataphractus*, will abundantly prove the statement now made. That being so, it is clear that the term *cuvieria* has no claim for application to the species, de Blainville's as much as Jäger's "Beschreibung" being "ungültig," in consequence of which, to use the words of Semper (*loc. cit.*), "wird der Selenka'sche Arname 'cataphractus' eintreten müssen." Perhaps, indeed, no creature has been more misrepresented; for C. A. Lesueur<sup>2</sup> says that "the feet are placed behind."

After a discussion which, however barren in the eyes of a naturalist, is not without necessity for the work of the systematist,

<sup>1</sup> Paris, Victor Masson (1849), in 22 vols.

<sup>2</sup> *Journal Acad. Nat. Sc. Philadelphia*, iv. p. 156. It is curious to note that of the 'Holothuries Cuvieriées' of Lesson, not one is a *Psolus* (see *Cent. Zool.* p. 239).

2/-

and which will, I trust, be found to contain an exact account of all the facts necessary for forming a judgment on the name to be applied to this generic division, I pass to an enumeration, first, of the forms supposed to be specifically distinct, and, secondly, of the specific names given to forms already described.

I. *List of the Species regarded as distinct.*

1. *antarcticus*, Philippi, Arch. Nat. 1857, p. 133. [B.M.]
2. *appendiculatus*, de Blainv. Dict. Sc. Nat. xxi. p. 317.
3. *boholensis*, Semper, Holoth. p. 62.
4. *cataphractus*, Sel. Zeitsch. wiss. Zool. xviii. p. 110.
5. *complanatus*, Semper, Holoth. p. 61.
6. *ephippifer*, Wyv. Thomson, Journ. Linn. Soc. xiii. p. 61.
7. *fabricii*, Düben & Koren, Hlgr. Kgl. Svensk. Akad. xxxii. p. 316 (note). [B.M.]
8. *operculatus*, Pourtalès, Bull. M. C. Z. i. p. 127.
9. *phantapus*, Strussenfeldt, Abh. schwed. Ak. xxvii. p. 268. [B.M.]
10. *poriferus*, Studer, M.B. Ak. Berl. 1876, p. 452.
11. *regalis*, Verrill, Proc. Bost. Soc. N. H. x. p. 357. [B.M.]
12. *squamatus*, Koren, Nyt Mag. iv. p. 211. [B.M.]

*Synonymous terms.*

1. *granulatus*, Ayres (Bost. Soc. N. H. iv. p. 63) = *regalis*<sup>1</sup>, Vl.
2. *lavigatus*, Ayres (Bost. Soc. N. H. iv. 25) = *phantapus*<sup>2</sup>.
3. *sitchaensis*, Brdt. (Prod. p. 47) = *fabricii*<sup>3</sup>.
- [4. *Psolus forbesi* (Ann. N. H. (1) xv. p. 174) has no more existence than such as is based on the sentence of Couch (Cornish Fauna, pt. ii. p. 73), "one closely allied to the genus *Psolus* of Mr. Forbes."]

PSOLUS FABRICII.

The most important fact with regard to this species that a survey of the British-Museum collection brings to light is an extension of its geographical distribution, which can hardly be said to be unexpected. Among the collections made by Captain H. C. St. John, R.N., in the Japanese seas (presented to the Trustees by Dr. J. Gwyn Jeffreys) are some small specimens which cannot, I think, be referred to any other than this species; for though they present an imbrication of the scales which is remarkable when compared with the extent of that imbrication in two large specimens from the coast of Greenland, it is not so remarkable when we take into consideration the example, intermediate in size between these two sets, which was collected off Greenland by H.M.S. 'Valorous' (and figured by Messrs. Duncan and Sladen in their 'Arctic Echinodermata,' pl. i.). Further, it is to

<sup>1</sup> The *Psolus granulatus* of Grube (Actin. &c. d. Adriat. u. Mittelmeers, 1840, p. 38) does not belong to this genus, but to *Hemicrepis*, J. Müller.

<sup>2</sup> See Stimpson, Inv. Gd. Man. p. 16 (1853, and not 1854 as given by Sel., and Verrill, Proc. Bost. Soc. N. H. xii. p. 353).

<sup>3</sup> See H. Ludwig, Zeitsch. f. wiss. Zool. xxxv. p. 588.

be noted (1) that there is just as much imbrication in a large specimen from Massachusetts Bay, collected by the United-States Fishery Commission, and presented by the Smithsonian Institution ; (2) that taking the three Greenland specimens already referred to, we find a most obvious relation between the size of the example and the extent of the imbrication of the scales, the latter decreasing as the former increases ; (3) that the same phenomenon is to be observed in the series of Japanese specimens, a study of which leads one to the conclusion that the increase in the covering-capacity of the bival armature is, at any rate, partly due to a diminution in the extent of the overlap of the different plates,. At the same time it is to be remembered that the Japanese specimens examined are all smaller than any one of those from the Atlantic which I have had the opportunity of comparing with them. And this must be borne in mind when the question of the range of distribution of this species again comes under discussion ; the writer who then treats of the matter will not, I trust, fail to carefully study the philosophical remarks on this subject which are to be found in Mr. W. Percy Sladen's account of Captain St. John's Japanese Echinoidea and Asteroidea<sup>1</sup>, where the importance of distinguishing the characters of forms with a wide distribution is most wisely insisted on.

In addition to the indications of a wider distribution than was suspected for this species, the preceding discussion brings also into prominence the fact that younger are more strongly imbricated than older specimens, but that, so far as we can judge from a single example, the American race retains more than the European this overlapping of the plates.

Just as the appearance of *Psolus fabricii* or a most closely allied form in the Japanese seas is a matter which need excite no wonder, so the second locality whence, as I fancy, the species is now for the first time recorded, only brings the species into the category of such circumpolar forms as *Strenylocentrotus drobachiensis* ; on the other hand, now that we know that the species is to be found at Kamtchatka, we are able to accept, with, as it were, a kind of personal experience, the fusion of *P. sitchaensis*, Brdt., with *P. fabricii*.

#### PSOLUS SQUAMATUS.

Two magnificent specimens of this species, the longest 130 mm. long, from the Gulf of St. Lawrence, were presented in 1880 by Principal Dawson ; and their examination brings to mind the view of some naturalists<sup>2</sup> that *P. fabricii* is nothing more than a variety of it.

At the first sight of the British-Museum specimens, such a view would be warmly rejected ; but now that we have learnt the kind of changes that occur in imbrication during growth, there would be no reason to imagine, even if we had not the figure of Koren, that *P. squamatus* in the young condition has the plates less imbricated than *P. fabricii*. On the other hand, the granulation of the scales in *P. squamatus* appears to be closer and the grains smaller ; and I have

<sup>1</sup> Jour. Linn. Soc. xiv. (1879) pp. 429-434.

<sup>2</sup> Cf. Duncan and Sladen, op. cit.

not been able to detect, in what is called *P. squamatus*, those cup-shaped spicules which are so well-known in *P. fabricii*; nor would they seem to have been seen by Düben and Koren, who, at any rate, do not figure them. This, of course, is only negative evidence; and, indeed, the whole discussion is a somewhat barren one until a large series of forms of all sizes can be brought together.

#### PSOLUS ANTARCTICUS.

In connexion with the discussion which is raised under the head of *P. fabricii* as to the extent of the area of distribution of that northern form, and the words of Philippi when describing the southern form, "diese Art ist der *Holothuria squamata*, O. Fr. Müll., so ähnlich, dass ich lange gezweifelt habe, ob ich sie nicht ohne weiteres dafür ansprechen sollte," it may be well to state explicitly what the differential characters appear to be.

(1) The body is much more flattened, or compressed from above downwards, instead of from side to side; very small examples are quite flat.

(2) The oral and anal valves are very much larger; and there is, as Philippi has already remarked, very much greater regularity in their arrangement.

(3) The bare integument on the trivial surface is very much thinner, and is in young specimens quite transparent.

(4) The scales are larger, and therefore less numerous: they are also much less granulated; but this is a character which varies so much within the range of a species that too much value must not be set on it.

On the whole, perhaps, *P. antarcticus* is as distinctly marked a species as any in the genus.

#### PSOLUS REGALIS.

The description given by Ayres of the internal characters of this species is so exact, that one regrets that he was not acquainted with the work of Grube, in which the name *Psolus granulatus* had been given to a totally different animal.

So far as the specimens now before me allow of an opinion, it would seem that even the external form is sufficient to distinguish the species from *P. phantapus*. *P. regalis* is longer and narrower, and the elongate-conical "tail" is much more nearly the result of a gradual tapering of the body; the granulation is much more evenly diffused, and there are no signs at all of any large plates.

The specimens in the national collection were presented by the Nova-Scotia Commissioners, and are all of large size.

#### PSOLUS PHANTAPUS.

Prof. Duncan and Mr. Sladen (op. cit.) direct attention to the resemblance between the young of *P. fabricii* and of this species, basing their remarks, as I understand, on specimens, a few millimetres long, which were determined by the Rev. A. M. Norman as the young of *P. phantapus*. Such of these examples as are in the British Museum

would have probably found themselves associated with *P. fabricii* had they not borne Mr. Norman's name. So far as can be gathered, no further information is accessible as to the early stages of the "tailed" species; and till such evidence or intermediate forms are to hand, it would perhaps be well not to use the information as undoubtedly exact; at the same time it is quite certain that, as they got the information from specimens determined by Mr. Norman, Messrs. Duncan and Sladen were fully justified in noticing it.

PSOLUS (LOPHOTHURIA) PERONII, n. sp. (Plate XLVIII. fig. 1.)

Form elongated, rounded, no caudiform prolongation; back and sides evenly rounded; neither oral nor anal region specially prominent; median row of suckers confined to three or four pairs at either end.

The body is covered by a very large number of scales, set pretty regularly in rows, only slightly imbricated near the margin. The scales may be covered completely by granules; or the central portion may be bare of them; or the whole scale may be free from granules, which may be found only around it. The irregularity presented by the scales is to be observed also in the oral and anal plates; as the covering-plates converge towards the mouth, some become larger, barer, and more tubercular in appearance: the same obtains with the anal region; but there is a very large amount of variation in the appearances produced.

The retractors of the pharynx are very long; the joints of the calcareous ring are well developed (Plate XLVIII. fig. 1 *b*); and there is a large saccular Polian vesicle.

The spicules from the integuments of the "foot" are of very much the same character as in *P. phantapus*; but the projecting spokes are rather long. They vary considerably in size (fig. 1 *c*).

Measurements:—length 60, 56, 55 mm.  
 breadth 34, 56<sup>1</sup>, 40 mm.  
 height 23, 33, 23 mm.

Length of Polian vesicle (at least), 8, 11 mm.

No definite locality can be given for the species; some of the specimens from the Haslar Hospital are stated to have been collected by Berthold Seemann. I have not been able to form a very clear idea of *P. operculatus* (Pourtalès); there is no doubt, of course, that it belongs to the Lophothurian subgenus: a number of specimens would seem to have been collected; and we may therefore presume that it is a rather small species (the length given by Portalès being 1½ inch, and the breadth  $\frac{3}{4}$  inch). *P. peronii* runs very much larger than this, and it is at least twice its size. So, again, the colour of *P. operculatus* is said to be light grey; this is not the case with *P. peronii*, for the pale yellow of some specimens is replaced by dark brown in others.

<sup>1</sup> Contorted.

*HYPOPSOLUS*, subgen. nov.

It is necessary to institute a new subgeneric division for a remarkable form, of which a complete account cannot be given, owing to the fact that there is, unfortunately, only a single specimen. The following, however, are important distinctive characters.

The covering-plates are mostly of large size and of considerable thickness, the whole covered by a rather thick integument, in which there are some calcareous deposits; the trivium is almost completely occupied by suckers. Tentacles? (retracted).

*PSOLUS (HYPOPSOLUS) AMBULATOR*, n. sp. (Plate XLVIII. fig. 2.)

There are six, not very regular, rows of large plates; at the edges there are a number of small scales, imbricated in the manner so common in the genus. The large plates extend round the base of the oral covering-plates and behind the anus; there are four or five plates in most of the rows; the large plates are of very various shapes; and though there are signs of a tendency to, there cannot be said to be any imbrication. The mouth and the anus have the positions ordinarily seen in other species of the genus; the five triangular oral plates are of very large size; but the five found round the anus are of a particularly small size. Many of the large plates, and of the orals, have one, two, or, in rare cases, three small pores on their integument; when the plate is laid bare, the pore is found to be the orifice of a small pit in the substance of the plate itself: the function of these plates cannot be even guessed at, their small size almost precluding us from the supposition that they are of a marsupial nature<sup>1</sup>—unless we suppose also that the present specimen is a male, or, in other words, a specimen in which the character is only faintly indicated.

On the trivial surface there are five or six rows of suckers in each lateral ambulacrum, and as many as ten in the median one; at either end the median is continuous with the two lateral ambulacra, and for the rest of the flat surface is separated from them by a narrow, bare, corrugated band.

*Measurements.*

	mm.
Length of trivial surface . . . . .	68
Breadth of trivial surface . . . . .	35
Height of anterior end . . . . .	31.5
Height of posterior end. . . . .	16
Size of some large plates = 12 × 10 mm.; 11 × 8; 9 × 6.	

*Hab.* Australia.

*Limits of the Genus.*—It will be seen that I have established a subgeneric division for the reception of a form remarkable for the thick covering of integument which is found over the large plates of

<sup>1</sup> Can they be compared with the perforations "for the passage of an ambulacral tube," found in a form allied to *Psolus*. See Sir W. Thomson, 'Nature,' vii. p. 388.



the test. The differences do not seem to me to be of really generic value, any more than are the distinctions which some have seen between what have been called *Psolus* and *Cuvieria*, or *Psolus* and *Lophothuria*, no naturalist, so far as I know, having followed Bronn (Classen u. Ordn. i. p. 404) in the use of the term *Lepidopsolus*.

A naturalist need know no other species than *P. fabricii* and *P. phantapus* to see what are the kind of claims for generic separation. In the one case there is a heavily-armed test, formed of strong imbricating scales, with only the margin of the foot provided with sucking-feet, and with the tentacles richly branched; in the other there are granulations, less richly branched tentacles, and a median set of sucking-feet<sup>1</sup>.

An investigation of the internal anatomy will not, however, reveal a difference in the part which should especially be affected in the more firmly bodied forms. We might, that is, expect to find valuable distinctive marks in the grade of development of the Polian vesicle, the size of which in *P. fabricii*, or any other heavily-armed form, would be easily enough ascribed to the fact that the impossibility of the walls of their body aiding in the propulsion of fluid through the ambulacral canals would require the propelling organ to be of larger size, and doubtless also of greater proportional strength. *À priori* considerations of this kind are often shown by the dry light of dissection and observation to be as little in consonance with fact as the nature of things allows; and that is certainly the case here: the Polian vesicle of *Psolus regalis* is proportionally as large as, even if it be not larger than, that of *P. fabricii*. A fact of this kind does, at the same time, teach us that what is apparently an external difference of great importance may be so as between, say, *Psolus* and *Holothuria*, but is not a great one between *Psolus* and *Lophothuria*. Such being the case, we have here an example of affinities so peculiar that what very rarely obtains among Echinoderms, at any rate, does seem to be presented here—a relationship that can best be indicated in the language of systematic zoology by making use of subgeneric divisions.

While *Psolus* may be spoken of as a Gasteropodous dendrochiro-tous Holothurian, with a flattened trivium and the bivium without suckers, and invested in a firm covering of calcareous pieces, *Psolus* (*Eupsolus*)s. str. will have granular plates, a median row of trivial suckers, and no basal web to the tentacles; *Lophothuria* large granulated scales or plates, no median row of suckers, and a basal web to the more richly branched tentacles; while *Hypopsolus* has the scales invested in a thick integument, and the trivial suckers numerous developed.

It is possible that future investigation will justify us in associating with these, as another subgenus, *Lissothuria*<sup>2</sup>, where "the upper surface of the body is covered with a soft smooth skin, in which are imbedded minute perforated plates."

<sup>1</sup> See Verrill, Proc. Bost. Soc. Nat. Hist. x. p. 353.

<sup>2</sup> Trans. Conn. Acad. i. p. 322.

## DESCRIPTION OF PLATE XLVIII.

- Fig. 1. *Psolus* (*Lophothuria*) *peronii*, n. sp. Upper view: nat. size.  
 1 a. — (—) —. Portion of trivial surface (to show arrangement of suckers): nat. size.  
 1 b. Pharynx of *P. peronii*.  
 1 c. Spicule of *P. peronii*.  
 2. *Psolus* (*Hypopsolus*) *ambulator*, n. sp. Upper view: nat. size.  
 2 a. — (—) —. Portion of trivial surface (to show arrangement of suckers): nat. size.  
 2 b. Outline view from the side, to show general configuration.  
 3. Enlarged view of portion of dorsal surface of *P. regalis*, to show the granular scales.  
 4. Enlarged view of portion of dorsal surface of *P. fabricii*, to show the granulated plates.

## 5. Note on a Crinoid from the Straits of Magellan.

By F. JEFFREY BELL, M.A., F.Z.S.

[Received October 23, 1882.]

In the last set of specimens received from Dr. Coppinger (Surgeon, H.M.S. 'Alert') is a single example of a Crinoid from the Straits of Magellan, which, by some accident, was not forwarded along with the other Echinodermata sent by him some time ago. In giving an account of that collection to the Society<sup>1</sup>, I directed attention to the absence of any representative of the Crinoidea; and I might have added that, so far as I knew, no other explorer of the marine fauna of the region from which it came had been able to meet with one.

It was therefore with considerable interest that I noted the arrival of this specimen in the British Museum; and I may add that I looked upon it with no little astonishment, as I conjectured how Dr. Coppinger must have doubted within himself whether he were really south of the Equator, and not again in those Arctic regions where *Antedon eschrichti* is so abundant; for it requires not only some acquaintance with specific characteristics to be able to detect any difference between the northern and the southern forms, but such differences as there are are exceedingly minute.

I have endeavoured to examine fully and carefully into the characters of the single, not quite complete, specimen of the Antarctic form; and although one may detect, on comparison with any given Arctic specimen, certain differences, such as may be expressed by saying that the cirri are a little more delicate, or not quite so long, or that a rather more distal joint is the longest of the series, yet marks such as these cannot be held to be distinctive of any thing more than of individuals.

When, however, we examine the pinnules, we find differences which enable us to distinguish the one from the other. As is well known, the pinnules at about the middle of the arm in *A. eschrichti* have the two basal joints of a notable shape, and so formed as to leave an interspace between them; in the Antarctic form, on the

<sup>1</sup> P. Z. S. 1881, p. 87.